

Set	Items	Description
S1	2	AU=(THEARLING K? OR THEARLING, K?)
S2	7187397	CAMPAIGN? OR PROMOTIOM OR PROMO OR ADVERT? OR AD
S3	9901865	SEQUENC? OR ORDER? ?
S4	26863931	MARKET OR MARKETING
S5	42	KURT(1N)THEARLING
S6	38	S5 AND S4
S7	33	S5 AND (DATA() (BASE? OR FILE? OR MINE? OR BANK?) OR DATABA- SE? OR DATAFILE? OR DATAMIN? OR DATABANK? OR STORAGE OR DB OR RECORD? ? OR SERVER OR CENTRAL() FILE)
S8	9	S5 AND (SEQUENC? OR MODE??)
S9	39	S6:S8
S10	24	S9 NOT PY>1999
S11	12	RD (unique items)

? show file

File 9:Business & Industry(R) Jul/1994-2004/Sep 28
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(c) 1999 Business Wire

File 813:PR Newswire 1987-1999/Apr 30
(c) 1999 PR Newswire Association Inc

11/7/1 (Item 1 from file: 9)
DIALOG(R)File 9:Business & Industry(R)
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2008423 Supplier Number: 02008423 (THIS IS THE FULLTEXT)

Focused Mining

(SAS Institute Inc and Exchange Applications Inc have entered into an agreement under which the latter's ValeX software will be integrated with SAS's Enterprise Miner)

Information Week, p 87+

November 24, 1997

WORD COUNT: 534

TEXT:

Marketing and data mining tools are married for targeted drilling

SAS Institute Inc. and Exchange Applications Inc. are partnering to integrate two technologies that can be used to get more value from data warehouses that store customer information. The software companies announced last week that they will automate data sharing between Exchange Applications' **marketing** -campaign software and a forthcoming data mining product from SAS.

Exchange Applications' ValeX software manages all aspects of a direct **marketing** campaign, including dividing customers into segments for targeted **marketing**, executing a **marketing** campaign, and evaluating the results. The application suite, introduced last year, is being used by a growing list of large companies, including Federal Express.

SAS and Exchange Applications plan to integrate ValeX with SAS's Enterprise Miner, data mining algorithms that are scheduled for availability in the first quarter of next year. Enterprise Miner, which enters testing this month, uses a variety of modeling techniques to find patterns or relationships among warehoused data and presents the results for analysis.

The companies intend to automate some of the time-intensive manual work that would be necessary to use the products together. For instance, through the connection to Enterprise Miner, ValeX will determine which **database records** to "score," or assign a probability for certain behavior, and when to score them. That should save time and reduce errors.

SAS and Exchange Applications already have many customers in common. "Every one of our customers is an SAS shop," says **Kurt Thearling**, director of advanced analytics with Exchange Applications, in Boston.

Fleet Bank, also in Boston, plans to use both ValeX and Enterprise Miner as part of a data warehouse environment that, beginning in January, will serve as the foundation for its **marketing** efforts. "We're delighted" by the product integration plans, says Randall Grossman, senior VP and director of customer data management and analysis with Fleet Bank.

figure omitted

Fleet's data warehouse--based on Informix's Extended Parallel **Server database** running on a cluster of Sun Microsystems servers--will pull data from 34 operational systems. Once the data has been formatted, the warehouse will feed it into two data marts, one running the ValeX applications and the other running Enterprise Miner and other data analysis tools from SAS. The SAS-Exchange Applications integration "frees up our analysts to focus on analysis and promotions, instead of having to make the

linkage work," says Grossman.

Wayne Eckerson, an analyst with the Patricia Seybold Group in Boston, says Enterprise Miner and ValEX are a good match. "One of the inefficient things about data mining tools is they're really not very well integrated into anything," says Eckerson. "Data mining tools have to become better integrated with the applications they support, as well as with the data warehouses they're drawing data from."

SAS and Exchange Applications announced their relationship at the National Center for **Database Marketing** conference in Orlando, Fla. SAS, in Cary, N.C., plans to strike similar pacts with other companies that provide technology for direct **marketing**. For instance, call-center or "customer interaction" applications and consumer demographic data could be tied in to SAS's data analysis product line. Says John McIntyre, **marketing** strategy manager for SAS: "We're very interested in coming to **market** with integrated tools to deliver a customer-relationship-management infrastructure."

--John Foley

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DIALOG(R)File 15:ABI/Inform(R)

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01783635 04-34626

USE FORMAT 9 FOR FULL TEXT

Increasing customer value by integrating data mining and campaign management software

ABSTRACT: Recently, marketers have added a new class of software to their targeting arsenal - data mining applications. These software applications automate the process of searching the mountains of data to find patterns that are good predictors of purchasing behaviors. After mining the data, marketers must feed the results into campaign management software that, as the name implies, manages the campaign directed at the defined **market** segments. In the past, the link between data mining and campaign management software was mostly manual, resulting in considerable inefficiency. Tightly integrating the 2 disciplines presents an opportunity for companies to gain competitive advantage. A discussion on how to integrate data mining and campaign management is presented.

Frawley, Andrew; Thearling, Kurt

Direct Marketing v61n10 PP: 49-53 Feb 1999 CODEN: DIMADI ISSN:

0012-3188 JRNL CODE: DIM

DOC TYPE: Journal article LANGUAGE: English LENGTH: 5 Pages

WORD COUNT: 2332

11/7/3 (Item 2 from file: 15)

DIALOG(R)File 15:ABI/Inform(R)

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01759940 04-10931

USE FORMAT 9 FOR FULL TEXT

How'd you get my name?

ABSTRACT: Concerns about data-related invasions of privacy are growing.

While the confidentiality of customer information has long been a given in the utility industry, the lines may blur in a deregulated environment. Utilities are beginning to build the data warehouses they need to store more detailed customer information. Guarding customer privacy will require increasing diligence, experts say, as utilities partner with other companies to sell new products and services. Few privacy bills have made headway in Congress. There are still **marketing** -oriented privacy bills on the horizon, however. Utilities would be wise to craft and publicize a privacy policy, inform all employees, and then, most importantly, adhere to it.

Prevost, Lisa

Public Utilities Fortnightly Data Warehousing for Electric & Gas Utilities
Supplement PP: 12-17 Winter 1999 CODEN: PUFNAV ISSN: 1078-5892

JRNL CODE: PUF

DOC TYPE: Journal article LANGUAGE: English LENGTH: 6 Pages

WORD COUNT: 2341

11/7/4 (Item 3 from file: 15)

DIALOG(R)File 15:ABI/Inform(R)

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01543070 01-94058

USE FORMAT 9 FOR FULL TEXT

Focused Mining

ABSTRACT: Exchange Applications Inc. and SAS Institute Inc. are partnering to integrate 2 technologies that can be used to get more value from data warehouses that store customer information. The software companies announced in November 1997 that they will automate data sharing between Exchange Applications' **marketing** -campaign software and a forthcoming data mining product from SAS. Exchange Applications' ValEX software manages all aspects of a direct **marketing** campaign, including dividing customers into segments for targeted **marketing** campaign, and evaluating the results.

Foley, John

Informationweek n658 PP: 87 Nov 24, 1997 ISSN: 8750-6874 JRNL CODE:

IWK

DOC TYPE: Journal article LANGUAGE: English LENGTH: 1 Pages

WORD COUNT: 551

11/7/5 (Item 1 from file: 16)

DIALOG(R)File 16:Gale Group PROMT(R)

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05923902 Supplier Number: 53160565 (THIS IS THE FULLTEXT)

Exchange Applications Executives to Present Advanced Customer Relationship Management Techniques At The Data Warehousing Institute's Leadership Conference.

Business Wire, p1625

Nov 2, 1998

TEXT:

BOSTON--(BUSINESS WIRE)--Nov. 2, 1998--

WHAT: Exchange Applications executives to present advanced Customer Relationship Management techniques at The Data Warehousing Institute's prestigious Fourth Annual Leadership Conference

WHEN: November 1-6, 1998

WHERE: Omni Rosen Hotel; Orlando, Fla.

Although many businesses have implemented state-of-the-art technology solutions for inventory control, accounting, manufacturing and even customer service, one area has historically remained in the dark ages: **marketing**. Relegated by many senior executives to "cost center" status, **marketing** is enjoying a resurgence as companies are discovering new ways to leverage technology to generate additional revenue through highly-targeted and automated direct **marketing** efforts.

Exchange Applications, based in Boston, helped stimulate the renaissance of **marketing** with its VALEX(tm) software, introduced in 1996. Today, VALEX is in use by more than 40 companies around the world, including FedEx, Fleet Financial Group, U S West, NatWest, Dutch Railways and Bank of America.

At The Data Warehousing Institute's Fourth Annual Leadership Conference, Exchange Applications executives will host the following sessions:

--"Put Powerful Data Mining Techniques into the Hands of the Knowledge Workers (and No One Gets Hurt)." Thursday, November 5, 9:00 a.m. - 10:00 a.m. This session, led by **Kurt Thearling**, Exchange Applications' senior scientist, will present a case study on a telecommunications company that successfully integrated two critical **marketing** tools: data mining techniques and campaign management.

--"A Step Beyond CRM: Continuous Customer Management." Tuesday, November 3, 3:05 p.m. - 4:15 p.m. Led by Sue North, Exchange Applications' director of solutions **marketing**, this session will explore an advanced Customer Relationship Management technique known as Continuous Customer Management (CCM). CCM provides a process and technology needed to optimize the value of all customer and prospect relationships by coordinating timely, pertinent customer communications across multiple touch-point channels.

For more information, or for a conference agenda, visit <http://www.dw-institute.com/conferences/orlando98/intro.html>

About Exchange Applications, Inc.

As the pioneer of customer optimization software, Exchange Applications, Inc. helps businesses optimize the value of customer relationships across channels and product lines. Its award-winning VALEX software and consulting services help businesses identify customer segments offering high profit potential, and then maximize the value of those segments through highly targeted and coordinated direct **marketing** campaigns. Exchange Applications provides marketers with the technology to plan, build, execute, analyze and refine **marketing** campaigns that produce measurable return on investment. Through VALEX, a company automates and accelerates its **marketing** process to improve customer acquisition, expansion and retention. Exchange Applications is based in Boston, with offices in Denver, London and Sydney. Visit Exchange Applications on the Web at www.exapps.com.

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DIALOG(R)File 16:Gale Group PROMT(R)

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05904317 Supplier Number: 53120665 (THIS IS THE FULLTEXT)

Datawarehouse.com Announces the "Editor's Choice Award".

Business Wire, p1323

Oct 26, 1998

TEXT:

MILWAUKEE--(BUSINESS WIRE)--Oct. 23, 1998--Datawarehouse.com is excited to announce Data Mining, **Database Marketing**, and Decision Support

Technology (Kurt Thearling) as this week's recipient of the Editor's Choice Award. This award highlights corporate and organizational Web sites that provide exceptional resources to the business intelligence and data warehouse industry. Chosen sites must promote the industry and demonstrate innovative services, programs or opportunities. Selection criteria also include design as well as ease of access to information. Congratulations to Data Mining, Database Marketing , and Decision Support Technology (Kurt Thearling) for demonstrating all of these qualities. The site, run by Kurt Thearling of Exchange Application, is located at <http://www.thearling.com/>.

The Editor's Choice Award was established in 1998 by the editorial team of DM Review magazine the No. 1 publication for business intelligence and data warehousing issues and solutions. The goal is to recognize excellence in Web sites that provide outstanding information and educational resources to the IT community.

Datawarehouse.com is owned and operated by Powell Publishing, Inc., the publishers of DM Review magazine.

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05351682 Supplier Number: 48140126 (THIS IS THE FULLTEXT)
Focused Mining -- Marketing and data mining tools are married for targeted drilling

Foley, John
InformationWeek, p87
Nov 24, 1997

TEXT:

SAS Institute Inc. and Exchange Applications Inc. are partnering to integrate two technologies that can be used to get more value from data warehouses that store customer information. The software companies announced last week that they will automate data sharing between Exchange Applications' **marketing** -campaign software and a forthcoming data mining product from SAS.

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05003587 Supplier Number: 47347682 (THIS IS THE FULLTEXT)

Mining your own business

Bank Marketing International, n82, pN/A

May 1, 1997

TEXT:

This month Michael Meltzer examines some of the possible applications of data-mining technology and the advantages to banks that are using it

IN MY previous article I stressed the major differentiation that a bank has in the information it can store on its customers. This article examines briefly some of the possible applications of data-mining technology and some of the banks that have found real value in its use.

With creative use of the data the bank has stored in numerous systems, but now brought together in the data warehouse, they can build up an understanding of the customer. That understanding can then be used to support strategic and tactical business decisions. One of the means of extracting meaningful knowledge from vast amounts of data is by using data-mining techniques.

Data-mining (now becoming a catchall) represents a means to semi-automate the search for relationships and casual patterns by sifting through and applying special techniques to the very large amounts of **data banks** can accumulate on customers and their activities.

In the early days (just a few short years ago) the process was seen as complex and expensive. Although there has been a move to reduce the perceived complexity, any valuable insights still tend to have a reasonably high price tag.

It may not be just a question of software purchased or the hardware,

but to achieve sustainable results, investment must be made in people and data **storage**. The rewards, however, when the search has been methodologically sound, have been high.

Data-mining as a term is often used to refer to knowledge discovery, but it also tends to include tools such as SQL, drill down (products), and OLAP for use on a data warehouse. We could therefore distinguish data-mining as a search for valuable insights from very large detailed **databases** using query tools.

Knowledge discovery is, however, the automated analysis of the **database** to "discover" useful, previously unknown facts. Therefore, we can view, Knowledge Discovery Systems (KDS) as a tool that helps the analyst identify where to look, ie where to concentrate the effort.

"All large US-based credit card issuers utilise expert systems in conjunction with data-mining technology to identify fraudulent transactions. Expert systems can identify known fraudulent patterns, but data-mining tools (primarily involving neural networks) can pinpoint new or previously unknown patterns." (META Group)

This article will look at a few techniques used and some of the banks that have applied them and had outstanding success.

Products management and operations

There is a tendency to separate **marketing** within a financial institution into a least two camps - products management and operations. While one attempts to search out new needs and affinity-based clusters for an increasingly fragmented **market** (read segment of one), the other attempts to execute campaigns cost-effectively whilst also attempting to reduce risk and increase the accuracy of the medium used.

Product management and operations are both interested in:

- Refining customer segmentation into meaningful sub- and, or even, micro-segments to enable more effective relationship management;
- Understanding what benefits customers try to get from the products they buy today and will want to buy tomorrow;
- Understanding what **models** can be created that will identify customers propensities to buy and what triggers dissonance;
- Knowing what segments are price sensitive to enable relationship pricing to be implemented;
- Building channel delivery **models** that can predict the most favoured channel for delivering current and new services and products;
- Implementing activities that target the right customers with the messages and enable an interactive dialogue if appropriate.

There are other interests imbedded within these such as fraud detection, direct **marketing**, **market** basket analysis, trend analysis, customer attrition and risk reduction.

Businesses also use the output of data-mining to develop **marketing** strategies, design branch layouts, analyse promotional effectiveness, target mailings and eliminate spending where certain pre-defined returns cannot be predicted.

Predictive Modelling

Predictive modelling is the prediction of a variable based on analysing how that variable relates to other variables in historical data. By using techniques known as supervised learning (neural networks), the system is trained on an historical **database** that includes data for the predictive variable, and the resulting **model** is used to predict the value for new data that does not include the original predictive variable.

A major UK bank (TSB, before it joined Lloyds) wanted to identify potential credit card customers that would more readily reply to a direct mail shot and would bring higher returns in terms of card usage coupled with a low risk of default profile. They tracked over eight million customers and were able to pinpoint those that fitted the required profile (see BMI 74) increasing response rates from 1 percent to nearer 4 percent.

A spokesman for the bank said "we can offer the right financial

products to the right customer at the right time, and we can target a particular programme or product to just those accounts that meet our criteria".

Royal Bank of Canada also believed that the old ways of mass **marketing** /mailing reduced customer intimacy. With data warehouse and mining technology the bank believes it is recreating that sense of customer intimacy. What the growth in size of banking industry and technology took away newer technologies enable banks to bring back!

Another example to consider is the account information (what accounts they have, the balances, and the like) along with other demographic data (where the customer lives, etc) held on bank customers. Banks would like to **market** home loans to the customers that are most likely to be interested.

The data for customers who already have homes loans is used to train the system. The resulting **model** is then applied to the customers that do not already have home loans, and the system selects those most likely to respond to the campaign by applying for the loan.

Another method used was to see how many customers in the last campaign sent regular payments to other financial institutions that were later found to represent home loans. This data, with amount parameters, was fed in to help identify existing bank customers that made large regular payments out but did not currently have a home loan with the bank.

These customers became another target group. This type of analysis reduced **marketing** costs and focused the bank's investment in campaigns that identified specific customer groups so increased response rates could be predicted.

Clustering

For over ten years, Bank of America (BoFA) has been creating a huge storehouse of data from its banking operations. The information flows from 42 separate "systems of **record**" daily, into the corporate data warehouse. The result is an information pool which provides a means for creating a relationship with each of the nine million customers at the bank; this forms the basis for developing long-term customised **marketing** programmes leading to segmentation of one dialogue.

The bank's data warehouse is so vast that traditional analytic approaches do not work. "For some customers, we have almost 300 different data points. With some techniques we could only analyse 20 [data points] at a time and no matter which 20 you chose, you were leaving out something potentially important," said Dyke Garrison at BoFA.

This is where the need for scalability of the tools comes in. With some tools you can look at hundreds of variables across tens of millions of **records**. (HYPER parallel).

There is a need to identify valuable **market** segments but that is just the start. For each **market**, BoFA can offer a wide variety of individualised product packages by tweaking fees, features and interest rates.

Couple this with the potential number of **marketing** messages delivered through numerous channels at different points in time, and the result is a huge number of potential strategies for reaching profitable customers.

Sifting through the immense number of possible combinations requires the ability to identify very fine but valuable opportunity segments.

By using powerful tools that work across their parallel data warehouse, the bank was able to determine that a certain set of customers were 15 times more likely to purchase a high margin lending product.

The bank then went beyond simply understanding who had acquired the lending instrument in the past and who would most likely buy today, to understanding when the customer was most likely to purchase. They believe the results of their work has been an improvement in response to their targeting of over 100 percent.

"The strategic implication is the transformation of the retail side of

BofA from a mass **marketing** institution to a targeted learning organisation," said Dave McDonald, vice-president of BofA's National Consumer Asset Group. It has also tested data-mining to determine what customers are bad risks to enable fraud avoidance whilst not alienating their existing customers.

BofA can use data-mining techniques effectively because of its belief in the need for keeping data at its atomic level. The prerequisite for a valid data-mining expedition demands a data warehouse.

The data warehouse in an integrative force in any information systems environment and enables the bank to function more effectively. Data needs to be available in huge quantities, scrubbed, loaded and accessible. Without granular data you cannot be sure that the answers derived have validity.

In addition to its granular data, BofA is also adding different types of customer trend information from commercial data service bureaux. They want to understand their customers and their target **market**. The tools they use range from standard SQL calls to SAS Institute, various OLAP products and in-house developed data-mining algorithms and software.

The Canadian Imperial Bank of Commerce (CIBC) has used data-mining to manage its mortgage portfolio. It used modelling, data analysis and prediction to review late payers for its mortgage product.

It wanted to create customer profiles of those that would most likely become a serious problem to the bank. To its surprise, it found that when conscientious payers fell behind in their payments they were the group most likely to fall even further behind.

They found that this group of customers were likely to be suffering real financial problems. This finding has enabled CIBC to react more quickly to this new counter intuitive situation and take remedial, supportive actions earlier.

Royal Trust, the private banking subsidiary of the Royal Bank of Canada, wanted "to build an information resource that was both up-to-date and event driven, and which could be used for predictive modelling, not just for old style historical analysis". (Dr A Gandy and Dr C Chapman TPD Ltd).

As with many other banks it has improved its response rates to direct-**marketing** campaigns, and used data-mining technique to: Increase revenue from target segments, increase their share of wallet, and retention, increase sales force productivity, as well as the use of alternative delivery channels.

Others like Chemical, Chase (now one bank), Banc One, Nations Bank and CitiCorp in the US have used the data warehouse and full data-mining for all the above and more in their quest to better use their unique competitive advantage - the information they have on their own customers - and to better understand and target those customers.

By understanding and profiling the most profitable customer to have, they can now better target the type of customer they want to have in their portfolio. In southeast France, Caisse d'Epargne Loire Drome Ardeche (CELDA), which is one of the largest of France's 31 savings banks, uses data-mining techniques and its data warehouse to answer many questions some of which are: Precisely who are our customers, what do they want, and what are their buying patterns?

Non-banks

Although banks in many ways were the pioneers of data warehousing and data-mining the non-banks are also heavy investors in this technology.

And as each new loyalty card, air mile or award system is created, data warehouse and DM tools are rapidly attached. Charles Wendel of FIS consulting in New York believes that there will be a shake-out in the banking industry. He sees that banks are taking lessons from non-banks, and those that plan on surviving will need to know how to mine their customer **database** and create defensible niche positions.

Data-mining is a useful set of philosophies, tools and applications

that can help a bank become more competitive. However technologies do not replace human capabilities but rather augment them. Data-mining products as yet don't understand the business.

"The key to making a successful data-mining software product is to embrace the business problems that the technology is meant to solve, not incorporate the hottest technology" (Dr Kurt Thearling , Pilot Software).

Any product or service used must be related to the business and will as a result create some actionable information. Most of the products that currently create real value require statistical interpretation and domain knowledge. If the value you searched for was easy to get at then would it really have value? "Information has value only to the degree that the receiver has invested effort in getting it. Getting information without lifting a finger means that everyone else is getting it, too - which means it is useless. The value of information is related directly to the degree that it is unique and that you can use it for personal benefit." (Stewart Alsop, New Enterprise Associates)

data-mining represents a means for banks to manage their customer and potential target customer relationships more effectively. To get to benefit from these techniques, the bank must understand that there is a competitive world out there and that traditional methods of survival will no longer cut it.

What has become apparent in all the work in the **marketing** domain to date is the refinement of the abilities of banks to better segment their customer base. This segmentation/clustering to eventually the segment of one, is of major concern to all banks. In their attempt to better serve this segment of one, the banks are applying a whole range of new technologies, one of which is the data warehouse. Additionally, it is computer-telephonic integration (CTI) that comes together through a fully integrated call centre.

In my next article I will look at some of the ways a data warehouse, mining tools, the Internet and the call centre are being integrated to better serve that segment of one.

Michael Meltzer has spent over 20 years in Banking and Information Technology using the customer-focused approach. His first degree is in **marketing** , he has an MBA and is currently a director for financial services consulting in NCR - a company that specialises in providing data warehouse solutions to the finance industry.

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DIALOG(R) File 16:Gale Group PROMT(R)

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04068454 Supplier Number: 45923073 (THIS IS THE FULLTEXT)

Pilot Software launches major new data mining initiative; Dun & Bradstreet unit signs prominent business information partners to design large scale, sales and marketing data warehousing applications.

Business Wire, pl1081143

Nov 8, 1995

TEXT:

CAMBRIDGE, Mass.--(BUSINESS WIRE)--Nov. 8, 1995--Pilot Software, Inc., a company of The Dun & Bradstreet Corporation and a leading global supplier of advanced business analysis and reporting software, today announced that it has launched a major new initiative focused on creating advanced sales and **marketing** applications that fully leverage large scale data warehouses using new data mining capabilities that will be delivered as part of LightShip, Pilot's scalable, on-line analytical processing (OLAP) environment.

Pilot has teamed with leading business information providers to offer solutions for the transportation, pharmaceutical and wireless industries. Leading the development effort for Pilot will be a team of scientists, formerly with Thinking Machines Corporation, who are recognized experts in advanced data analysis technology.

Data mining techniques allow business users to discover and explore relevant hidden and predictive information housed in massive data warehouses. The automated, prospective analyses offered by data mining move beyond the analyses of past events provided by traditional retrospective data access tools to answer business questions that until now have been too time-consuming to resolve. The data mining tools being developed by Pilot and its partners will enable sales and **marketing** professionals to predict future trends and behaviors, allowing them to make proactive, knowledge-driven decisions. Users will be able to identify the best customers or prospects for a specific **marketing** effort, automatically segment those customers by the most relevant attributes and predict the effectiveness of promotional plans.

"Pilot today provides the most scaleable OLAP environment in the industry enabling users to quickly implement advanced business analysis applications across their organizations," said John Fleming, Pilot's vice president of **marketing**. "We are expanding our OLAP capabilities to allow our customers to fully leverage their corporate data warehouses using these new data mining tools. The leading business information providers in credit, pharmaceutical, and wireless are partnering with Pilot to develop state-of-the-art enterprise-class OLAP solutions."

Pilot's partners in developing these sales and **marketing** data mining applications are:

Dun & Bradstreet Information Services, a provider of business-to-business information and services, with the world's largest business information **database** covering over 39 million companies worldwide, is working with Pilot to integrate data mining tools into its **Market Spectrum** suite of **database marketing** products and services, with an initial focus on the transportation industry. Using these data mining capabilities, transportation executives will be able to identify potential customers and their purchasing patterns for transportation services from DBIS' data warehouse of millions of businesses worldwide.

IMS America, the leading provider of worldwide **market** research, sales management and decision support services for pharmaceutical and other healthcare related industries, is integrating the data mining tools being developed by Pilot into its Xplorer sales and **marketing** data warehouse suite of products. With these tools, pharmaceutical companies will be able to manage their product portfolios at a level of detail unattainable before -- allowing them to track sales of multiple products at the prescriber level and allocate **marketing** resources accordingly.

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"D&B's goal is to create business insight for its customers," said Dennis G. Sisco, executive vice president of The Dun & Bradstreet Corporation. "The powerful data mining and information management initiatives we are announcing today will help us to do that, by extracting exciting new insights from the massive amounts of data now collected both by our customers and by D&B. These initiatives will, for the first time, open

vast data warehouses to fast, accurate, distributed decision making for our customers."

Leading Pilot's development efforts for the data mining initiative is a team of scientists and developers who were responsible at Thinking Machines Corporation for developing a sophisticated suite of data mining tools for parallel supercomputers. Stephen Smith is Chief Scientist for Pilot's Data Intelligence group, which includes Mario Bourgoïn, **Kurt Thearling**, Emily Stone and Joe Yarmus. The team has more than 30 cumulative years' experience in data mining, parallel computation, very large **database** analysis, machine learning and data visualization.

Pilot Software, Inc., a company of The Dun & Bradstreet Corporation, is a leading global supplier of advanced business analysis and reporting software to organizations who need to make critical decisions in rapidly changing environments. Pilot's LightShip product family is the most scaleable OLAP environment for high-performance planning and analysis applications requiring customized multidimensional access and visualization of enterprise information. Pilot Software is headquartered in Cambridge, Mass., and has a strong international presence with offices throughout North and South America, Europe and the Pacific Rim. For more information, Pilot's home page can be reached at <http://www.pilotsw.com>. -0-

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Datamining **for the masses. (includes related articles on major technologies and datamining 's future) (Technology Information) (Cover Story)**
Darling, Charles B.
Datamation, v43, n2, p52(5)
Feb, 1997

TEXT:

You don't need a Ph.D. in statistics or AI to get into **datamining**. A crop of new tools promises to shield you from the horrendous complexity of neural networks, genetic algorithms, regression techniques, and decision trees.

DATAMINING USED TO BE THE PROVINCE OF statisticians and AI experts. In the face of talk about outliers, chi-square detection, and k-nearest neighbors, only those IS managers with the stomach for the exotic would attempt to deploy **datamining** technologies that included neural networks, genetic algorithms, and decision trees. But now, user-friendly products such as IBM's Intelligent **Data Miner**, Silicon Graphics' MineSet, and Thinking Machines' Darwin are promising to bring **datamining** to the masses.

First, though, you need to remember that **datamining** does not exist in a vacuum. For starters, you'll need a corporate data resource containing

information worth mining. Next you need the computer hardware, operating systems, and infrastructure necessary to support your mining effort. Only then are you ready for the statistical and AI techniques that can help you extract hidden meaning from your data.

Kurt Thearling, Ph.D., a cocreator of Thinking Machines' Darwin product, points out that the core components of **datamining** technology have been under development for decades in research areas such as statistics, artificial intelligence, and machine learning. "Today, the maturity of these techniques, coupled with high-performance **databases** and broad data integration efforts, make these technologies practical," says Thearling, who is currently a senior scientist and founding member of the Data Intelligence Group at Pilot Software.

Datamining, with its cachet of exotic statistical methods and eerily biological processes, is definitely a hot technology. But don't let the excitement of innovation distract you. Without a careful, comfortable fit into your workaday data and technology practices, you could well end up mining a crock of fool's gold.

IS in **datamining**

IS has a vital role to play in seeing that that doesn't happen. The diagram "Put **datamining** in context" on p. 55 is a road map to the different things you'll have to consider when fitting **datamining** into your operation.

The diagram shows a simple connection between the data warehouse and your **datamining** and decision support resources. At the point where **datamining** is today, that's a bit of an oversimplification. You might do it as the diagram implies: Collect the data in the data warehouse, handling all of the extraction, scrubbing, scheduling, and loading as part of your data-warehousing effort. If you have a well-established, robust data warehouse that can supply the demands of your **datamining** operation, that approach should be fine.

But there are alternatives. Some **datamining** products--IBM's Intelligent **Data Miner**, for example, and Silicon Graphics' MineSet--come with data-preparation tools that can handle some or all of what you have to do to get data ready to be mined. If your data warehouse isn't ready for mining, or if political or architectural forces suggest that a **datamining** effort independent of the data warehouse would be wise, then this approach might be attractive.

Between these two approaches lies a third possibility. The data warehouse in the diagram could instead be a datamart. The datamart could be a normal subject-matter-based datamart, or it could be a specialized datamart, designed and constructed solely to support a **datamining** effort. This middle approach has intriguing possibilities if your company's data-warehousing initiative is under way but still maturing.

The diagram also shows that how you handle purchased data is an important consideration in putting **datamining** in context. You've built a **model** or discovered a pattern in your own data, let's say. The next step is often to apply that knowledge to a **database** from outside the boundaries of your company in order to, for example, find a bunch of hot, new **marketing** prospects. Getting data to work with usually isn't a problem--that's what companies like Lexis, TRW, and Dun & Bradstreet are all about.

But there's a sneaky bit of the diagram that we mustn't pass by hastily. "**Datamining**" and "decision support" look real cozy there together--but how are they really connected? The answer will vary depending on the tools you buy and the details of the mining you're doing. There are some products that address both functions. Holos 5.0, for example, includes **datamining** tools that can access data stored in the Holos OLAP format or in your favorite RDBMS. Another example is the OLAP tool in Pilot Software's Decision Support Suite, which can access the data created by the suite's Discovery **Server datamining** tool for a

multidimensional view of your results.

Now comes the interesting part.

The **datamining** and decision support work are done, and there's a result: a list of hot sales prospects, a new credit-granting algorithm, a new product design, whatever. It's important to be aware that some or all of those results are going to land right back in IS' in-basket: "Run this list of prospects into the direct-mail program." "Update the order-entry program to use this new credit check." It's yet another demand you need to be prepared for, especially if the **datamining** activity is frequent and frequently successful.

The final step in seeing **datamining** in context is covered in the rest of the diagram. Your everyday operations get spiif3' new improvements or better data. They run and create transactions. The transactions find their way back into the data warehouse, and the cycle starts again. But this time it's working from slightly better data. In fact, given the leverage that modeling and pattern detection seem to exert, the results could be significantly better. The feedback loop--that positive cycle of constant improvements--may rapidly drive **datamining** to the top of people's agendas in the months to come.

Datamining on sale

When that happens at your company, where will your **datamining** technology come from? Thankfully, we're past the bleeding-edge stage. You no longer have to hire Ph.D.'s in statistics and artificial intelligence away from academia, set them up a lab somewhere, sprinkle liberally with money, and hope for the best. There's packaged technology out there--a bewildering variety of packaged technology, in fact. The trick is to find a product that you can turn into a business solution.

Not just any **datamining** software will do. As Thearling says, "Unfortunately, **datamining** is being touted as a business solution when it is simply the base technology upon which business solutions might be built."

As you begin looking at commercial **datamining** software, you'll notice an interesting dichotomy. On the one hand, the core technology, in many cases isn't particularly new. Neural networks, for example, have a long and interesting history dating back to the 1950s. (For more detailed information, see Apprentices of Wonder by William F. Allman, Bantam Books, 1989.) What's new, however--and missing entirely in some cases--are the features and functions that let you create business solutions with the technology.

Here's a new feature set you'll certainly want to look into: automation. People have been doing **datamining** for years, actually, but the tools they used weren't particularly automated. They didn't need to be--these people were experts in statistics or AI and didn't mind spending weeks setting up the programming and the data for a single run.

A business solution must be much more approachable than that, and to varying degrees the commercial **datamining** packages are.

Take, for example, **DataMind** from the company of the same name. The product is approachable, all right--it uses Microsoft's Excel as its user interface. Holos, which Seagate Software acquired with its purchase of Holistic Systems, is another good example. It uses a standard Windows form with radio buttons, check boxes, and so on to set up a search for patterns. To build a neural network, Holos deploys a wizard that walks the user through a set of dialogues.

This degree of automation might be unnecessary or even irksome to a specialist, if that's who's mining your data. As Alexis dePlanque, a senior research analyst at the Meta Group, points out, making these tools easy to use involves a tradeoff. "They greatly reduce the amount of customization you can do," she says. "And they massage the output for you so you don't get all this complex statistical information." For relatively unsophisticated **datamining** efforts, that's not a big problem, but it's

probably not acceptable in a more challenging project.

Scalable tools

Another big issue in commercial **datamining** software is scalability. Remember those gigabytes (terabytes?) of your corporate data? The more of that you can mine per unit time, the smarter your company will be. Products like **DataMind** and Angoss' Knowledge Seeker emphasize desktop and client/**server** processing, which is fine. Well, up to a point. If your needs are likely to take you beyond that point, you'll be drawn toward products that call fully exploit parallel processing. Thinking Machines' Darwin came out of the parallel environment. And products from IBM, HyperParallel, Information Discovery, NeoVista Solutions, and Silicon Graphics offer parallel capabilities, as well.

A third area that's new to many commercial **datamining** products is the whole issue of integration, of fitting **datamining** technology into the larger IS context. Does the product run on platforms and configurations that you already support, you might ask. Can it access the **databases** you're already using? Will your programmers' and system managers' existing skillsets position them well to deal with the new tool, or are you looking at a big chunk of new material they'll have to master? All of these questions, and more, are crucial measures of the degree to which a product--no matter how impressive its **datamining** pedigree--is ready for IS prime time.

Given the newness of the **datamining** marketplace, it's not surprising to find the technology packaged in a variety of ways. For the desktop **dataminer**, there are products like Holos, Knowledge Seeker, HNC Software's DataMarksman, or Business Objects' new BusinessMiner. If **datamining** becomes an important corporate strategy., however, you might want to look at a suite of tools--ones that might include neural networks, rules induction, pattern discovery., and decision trees, for example. Such suites are currently being offered by vendors such as IBM and Thinking Machines.

"Long term, that's probably the way to go," says dePlanque. "It offers you more flexibility, because you're not tied to one technique. As you learn more and your requirements change, you've got the flexibility, to grow and change."

But flexibility isn't everything. Maybe you don't need a **datamining** tool so much as you need a **datamining** application. Vendors like HNC and IBM offer **datamining** applications that include customer segmentation, **market** -basket analysis, and fraud detection, sparing you at least some of the heavy lifting in creating a specific **datamine**.

Or maybe you don't need a tool or an app so much as you need a complete solution. You could always outsource the whole effort to a company like IceBreaker from Alameda, Calif. You'd ship your data to IceBreaker, and the company would perform the **datamining** and ship you back the results. IBM also offers a similar service.

The **datamining** plunge

Whatever form of **datamining** suits you best, you'll likely find yourself plunging into some pretty exciting territory.

But **datamining** should not be viewed as a panacea. " **Datamining** is not as free and fuzzy as people are being led to believe," says Herbert Edelstein, president of Two Crows Corp., a **datamining** consulting firm based in Potomac, Md. Adds Bernice Grossman, principal of DMRS, a New York City-based data-warehousing consultancy, "The best design and the most brilliant strategic plan all put together in the most accessible, actionable **marketing database** is virtually useless if you don't spend the time to learn your data. I repeat, it will not matter how much money you spend." With additional reporting by Vance McCarthy.

Additional resources

Datamining papers:

* www.santafe.edu/~kurt/index.shtml

- * www.cs.bham.ac.uk/~anp/papers.html
- * coral.postech.ac.kr/~swkim/old_papers.html

Datamining conferences:

- * www.cs.bham.ac.uk/~anp/conferences.html

Datamining products:

- * coral.postech.ac.kr/~swkim/software.html

Datamining projects and information sources:

- * www.cs.uah.edu/~infotech/mineproj.html

Major **datamining** technologies

Neural networks: A computer whose architecture is patterned after the neurons in the human brain. It's made up of a web of electronic neurons that send signals to each other through thousands of connections, which are adjusted up or down as the machine learns particular applications. A neural network can be taught voice recognition, for example, simply by having a trainer speak words into the machine, reinforcing some connections and not others.

Decision tree: A tree-shaped structure that represents a set of decisions that can be used to predict which **records** in a new (unclassified) dataset will have a given outcome. Two decision tree technologies include:

- * **Classification and regression tree (CART)**-A decision tree technique that creates a structure of two-way decisions.

- * **Chi square automatic interaction detection (CHAID)**-A decision tree technique that creates a structure of multiway decisions.

Rule induction: The extraction from data of useful if-then rules based on statistical significance. **Genetic algorithms:** Optimization techniques based on the concepts of genetic combination, mutation, and natural selection.

Nearest neighbor: A classification technique that classifies each **record** based on the **records** most similar to it in a historical dataset.

SOURCES: **KURT THEARLING**, PILOT SOFTWARE; IBM; DATAMATION

What's holding back **datamining** ?

Datamining technology has been brewing in labs around the world for years. Will the leap from lab to laptop be an easy one? **Kurt Thearling**, Ph.D., Pilot Software senior scientist and a cocreator of Thinking Machines' Darwin product, points to some potential hurdles:

- * **Datamining** products that don't understand business. "The key to making a successful **datamining** software product is to embrace the business problems that the technology is meant to solve, not to incorporate the hottest technology," says Thearling. Can the product formulate a business problem in terms that will produce actionable results? Look for help from templates and metadata specific to your industry.

- * **Datamining** products that require statistical or modeling expertise. Setting up the parameters to build a **datamining** system requires expertise that the business user doesn't-and shouldn't have to-have. "The user should be asked for things related to his or her world," says Thearling. A **datamining** product must translate between the information the users supply about their problems and the parameters required by the technology.

- * **Datamining** products that don't understand industry standards. **Database** mining must fit well and smoothly into a company's existing IT infrastructure to be useful. Thearling rightly points out that "users do not want to deal with dumping an RDBMS to a flat file or translating between different data formats." IS expects other products to speak SQL and ODBC, run on popular platforms, support popular desktop tools, and so on. **Datamining** products must be prepared to live up to those expectations.

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PILOT SOFTWARE: Pilot Software launches major new data mining initiative
M2 Presswire, pN/A
Nov 22, 1995

TEXT:

M2 PRESSWIRE-22 November 1995-PILOT SOFTWARE: Pilot Software launches major new data mining initiative -- Dun & Bradstreet unit signs prominent business information partners to design large scale, sales and **marketing** data warehousing applications (C)1994-95 M2 COMMUNICATIONS LTD

RDATE:211195

Pilot Software, Inc., a company of The Dun & Bradstreet Corporation and a leading global supplier of advanced business analysis and reporting software, announces the launch of a major new initiative focused on creating advanced sales and **marketing** applications that fully leverage large scale data warehouses. New data mining capabilities will be delivered as part of LightShip, Pilot's scaleable, on-line analytical processing (OLAP) environment.

Pilot has teamed up with leading business information providers to offer solutions for the transportation, pharmaceutical and wireless industries. Leading the development effort for Pilot will be a team of scientists, formerly with Thinking Machines Corporation, who are recognised experts in advanced data analysis technology.

Data mining techniques allow business users to discover and explore relevant hidden and predictive information housed in massive data warehouses. The automated, prospective analyses offered by data mining move beyond the analyses of past events provided by traditional retrospective data access tools to answer business questions that, until now, have been too time-consuming to resolve. The data mining tools being developed by Pilot and its partners will enable sales and **marketing** professionals to predict future trends and behaviours, allowing them to make proactive, knowledge-driven decisions. Users will be able to identify the best customers or prospects for a specific **marketing** effort, automatically segment those customers by the most relevant attributes and predict the effectiveness of promotional plans.

"Pilot today provides the most scaleable OLAP environment in the industry enabling users to quickly implement advanced business analysis applications across their organisations," said John Fleming, Pilot's Vice President of **Marketing**. "We are expanding our OLAP capabilities to allow our customers to fully leverage their corporate data warehouses using these new data mining tools. The leading business information providers in credit, pharmaceutical, and wireless industries are partnering with Pilot to develop enterprise-wide OLAP solutions."

"D&B's goal is to create business insight for its customers," said Dennis G. Sisco, Executive Vice President of The Dun & Bradstreet Corporation. "The powerful data mining and information management initiatives we are announcing today will help us to do that, by extracting exciting new insights from the massive amounts of data now collected both by our customers and by D&B. These initiatives will, for the first time, open vast data warehouses to fast, accurate, distributed decision making for our customers."

Notes to Editors

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Pilot Software, a company of the Dun & Bradstreet Corporation, is a leading worldwide supplier of business intelligence software and services to Fortune 1 000 organisations which need to make critical decisions in rapidly changing business environments. Pilot's LightShip Suite is a complete integrated set of Client/ **Server** development tools used for developing business intelligence systems, quickly and easily. Pilot Software is headquartered in Cambridge, Massachusetts (USA), and has a strong international presence with offices throughout Europe, North and South America, and the Pacific Rim. Pilot Software UK is based in Chertsey, Surrey, and serves major British companies across a wide range of business sectors with a specific focus on: retail; FMCG; insurance; banking; public sector; manufacturing and leisure industries.

Lightship is a trademark and Pilot is a registered trademark of Pilot Software, Inc. All other products are trademarks of their respective holders.

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REMINDER/Exchange Applications Executives to Present Advanced Customer Relationship Management Techniques At The Data Warehousing Institute's Leadership Conference

BUSINESS WIRE

November 03, 1998

BOSTON--(BUSINESS WIRE)--Nov. 3, 1998--

WHAT: Exchange Applications executives to present advanced Customer Relationship Management techniques at The Data Warehousing Institute's prestigious Fourth Annual Leadership Conference

WHEN: November 1-6, 1998

WHERE: Omni Rosen Hotel; Orlando, Fla.

Although many businesses have implemented state-of-the-art technology solutions for inventory control, accounting, manufacturing and even customer service, one area has historically remained in the dark ages: **marketing**. Relegated by many senior executives to "cost center" status, **marketing** is enjoying a resurgence as companies are discovering new ways to leverage technology to generate additional revenue through highly-targeted and automated direct **marketing** efforts.

Exchange Applications, based in Boston, helped stimulate the renaissance of **marketing** with its VALEX(tm) software, introduced in 1996. Today, VALEX is in use by more than 40 companies around the world, including FedEx, Fleet Financial Group, U S West, NatWest, Dutch Railways and Bank of America.

At The Data Warehousing Institute's Fourth Annual Leadership Conference, Exchange Applications executives will host the following sessions:

--"Put Powerful Data Mining Techniques into the Hands of the Knowledge Workers (and No One Gets Hurt)." Thursday, November 5, 9:00 a.m. - 10:00 a.m. This session, led by **Kurt Thearling**, Exchange Applications' senior scientist, will present a case study on a telecommunications company that successfully integrated two critical **marketing** tools: data mining techniques and campaign management.

--"A Step Beyond CRM: Continuous Customer Management." Tuesday, November 3, 3:05 p.m. - 4:15 p.m. Led by Sue North, Exchange Applications' director of solutions **marketing**, this session will explore an advanced Customer Relationship Management technique known as Continuous Customer Management (CCM). CCM provides a process and technology needed to optimize the value of all customer and prospect relationships by coordinating timely, pertinent customer communications across multiple touch-point channels.

For more information, or for a conference agenda, visit <http://www.dw-institute.com/conferences/orlando98/intro.html>

About Exchange Applications, Inc.

As the pioneer of customer optimization software, Exchange Applications, Inc. helps businesses optimize the value of customer relationships across channels and product lines. Its award-winning VALEX software and consulting services help businesses identify customer segments offering high profit potential, and then maximize the value of those segments through highly targeted and coordinated direct **marketing** campaigns. Exchange Applications provides marketers with the technology to plan, build, execute, analyze and refine **marketing** campaigns that produce measurable return on investment. Through VALEX, a company automates and accelerates its **marketing** process to improve customer acquisition, expansion and retention. Exchange Applications is based in Boston, with offices in Denver, London and Sydney. Visit Exchange Applications on the

Web at www.exapps.com.

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